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ABSTRACT

Addressing two issues of Dweck and Leggett's (1988) social cognitive theory of personality, this short-term longitudinal field study investigated the relationship between implicit theories about the self and school anxiety among adolescents making the transition to junior high school. It was hypothesized that students who believed that their attributes were fixed aspects of the self would experience more anxiety than others, particularly if the former reported low confidence in the attribute. Participating were 110 seventh graders who responded to assessments of theory of intelligence, confidence in intelligence, and school anxiety. Findings indicated a main effect for theory of intelligence, showing that, compared to 'incremental theorists', 'entity theorists' had higher anxiety levels. A main effect for confidence in intelligence showed that students with low confidence had higher anxiety than others. As predicted, the interaction of these two variables was significant, indicating that entity theorists with low confidence had higher anxiety than other students. Analogous measures in the domain of personality yielded similar results. No main effects were found for sex of subject. The effect of grades on anxiety was not significant. It is concluded that results support Dweck and Leggett and provide insight into the 'storm and stress' hypothesis, indicating that for some students the changes in adolescence are threatening, while others may find them an opportunity for growth and development. Figures and assessment instruments are attached. (RH)

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PREDICTING INDIVIDUAL DIFFERENCES IN SCHOOL ANXIETY IN EARLY ADOLESCENCE

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A poster presented at the biennial meeting of the Society for Research in Child Development, Kansas City, MO (April 1989).

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Predicting Individual Differences in School Anxiety in Early Adolescence.

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This study investigated the relationship between implicit theories about the self and school anxiety among adolescents making the transition to Junior High School. It was hypothesized that students who believed that their attributes, such as intelligence, were fixed entities residing in the self (entity theorists) would experience more anxiety, particularly if they reported low confidence in the attribute.

In this study, 110 seventh graders responded to assessments of theory of intelligence, confidence in intelligence, and school anxiety. Results were in accord with predictions. A main effect for theory of intelligence showed that entity theorists had higher anxiety levels. A main effect for confidence in intelligence showed that students with low confidence had higher anxiety. As was predicted, the interaction of these two variables was significant, indicating that entity theorists with low confidence had higher anxiety than other students. Analogous measures in the domain of personality yielded similar results.

No main effects were found for sex of subject, and, interestingly, the effect of grades on anxiety was not significant.

These results support the theory proposed by Dweck and Leggett (1988), and provied some insight into the 'storm and stress' hypothesis, indicating that for some students the changes in adolescence are threatening, while others may find them an opportunity for growth and development.

Theoretical Background

In 1988, Dweck and Leggett proposed a social cognitive theory of personality in which implicit beliefs about attributes are related to the characteristic ways in which individuals cope with challenging situations. They suggested that individuals who conceive of attributes, such as intelligence, as fixed, unchangeable entities (an "entity theory") are more likely to engage in maladaptive behaviors when they encounter difficulty in situations reflecting on their intelligence. In lab settings, children with an entity theory of intelligence have been found to attribute failure to a lack of ability, to express negative affect and to show marked deterioration in performance following a failure experience. In contrast, individuals who conceive of such attributes as malleable qualities that can be increased (an "incremental theory") are less vulnerable to maladaptive behavior patterns. In lab studies, incremental theorists have been more persistent, maintaining high levels of effort and a positive prognosis, have expressed positive feelings and have sustained their high levels of performance following a failure experience.

This relationship between implicit beliefs and behavior is qualified by the individual's confidence in the attribute. Within the entity theory framework, lower confidence is particularly related to the maladaptive behavior patterns. However, within the incremental theory framework, individuals are task-oriented, persistent and maintain positive affect regardless of their confidence level.

The study reported here addresses two issues regarding the generalizibility of the theory. Much of the supportive research has been laboratory analog studies. This study is a field study, and examines the relationship between theories of intelligence and naturally occuring behavior. Early adolescence is a period in which some students experience considerable anxiety and begin to show marked deterioration in school performance, a pattern much like the maladaptive pattern described above. This study seeks to test the theory by examining the relationship between theories of intelligence and school anxiety, as well as school performance, in early adolescence. In addition, this study examines whether the relationship between implicit theory and behavior holds for domains other than the academic domain. Therefore beliefs in a second domain, the social domain, are also studied.

Dweck, C.S., & Leggett, E.L., A social-cognitive approach to motivation and personality. Psychological Review 1988, 95: 256 - 273

Aims of the Study

This study investigated the relationship between implicit beliefs and the experience of anxiety in early adolescence. The theory suggests that individuals with an entity theory and low confidence will be more likely to experience higher anxiety, as compared to other students. In addition, the theory suggests that in challenging situations, entity theorists are less likely to persist at tasks that require sustained effort. This implies that in a new, more challenging academic environment, implicit beliefs may predict academic performance. Implicit beliefs in two domains were studied, the academic domain (via assessing theories of intelligence and confidence of intelligence) and the social domain (via assessing theories of personality and confidence of personality).

Questions regarding anxiety:

1. Do entity theorists with low confidence report higher levels of anxiety and is this true both for theories of intelligence and for theories of personality?

2. Are there other important variables related to anxiety in school--particularly does gender or actual school performance contribute to anxiety?

Question regarding academic performance:

3. Is there a relationship between implicit theories of intelligence, confidence of intelligence and students' performance in school as measured by first term grade (controlling for prior achievement)?

Methods

Design of the study:

This was a short-term longitudinal field study. Assessments were made during the eighth week of school and during the fifteenth week of school. Students received their first report card of the year during the tenth and eleventh weeks of school. Students were all seventh graders in a 7-8 junior high school and thus, they had just made a school transition. This school environment was selected in order to maximize the variance in school anxiety, since past research has shown that school transitions during early adolescence are stressful for many students.

Subjects:

Data from 110 students were included in the analyses reported here. Although 228 students completed the assessments, only the 110 clear cases over the two assessments were analysed. These students could be clearly classified as entity or incremental theorists in each domain. The theory measure asked students to indicate their level of agreement with three statements embodying the entity theory. This measure was administered at each of the two assessments, and the six responses were averaged to get a mean theory score (ranging from 1.0 to 6.0) for each subject. In order to create clear groups, we dropped from further analysis those students who fell within one-half a standard deviation above or below the grand mean for the sample. This effectively eliminated those students who were inconsistent in their responses, or who changed their pattern of responding over time, since such scores would fall closer to the grand mean than would the scores of students who were clear cases of either theory.

For the theory of intelligence measure, students whose score fell below 3.47 were classified as entity theorists, and those whose score was above 4.49 were classed as incremental theorists.

Likewise, for the theory of personality measure, students whose score fell below 3.29 were classified as entity theorists, and those whose score was above 4.41 were classed as incremental theorists.

In order to classify individuals as high or low confidence, we used a median split, since the interest was in confidence in a relative sense and it was desireable to have approximately equal numbers in each group. However, we dropped from further analysis those subjects who had a confidence score that fell at the median. For the confidence of intelligence measure, the median was 4.30 and for the confidence of personality measure, the median was 3.75.

89% of the subjects hold the same theory in both the intelligence domain and the personality domain.

DESCRIPTION OF SAMPLE

Theory of Intelligence and Confidence of Intelligence

by

Theory of Personality and Confidence of Personality

		THEORY OF INTELLIGENCE: Entity, High	Entity, Low	Incremental, High	Incremental, Low	
PERSONALITY THEORY: Entity, High	Boys	7	2	2	1	26
	Girls	7	4	2	1	
Entity, Low	Boys	7	10	0	1	28
	Girls	2	7	0	1	
Incremental, High	Boys	1	1	13	4	35
	Girls	1	0	13	2	
Incremental, Low	Boys	0	0	6	3	21
	Girls	0	1	5	6	
		25	25	41	19	

N = 110
Note: 89% hold consonant theories across domains

Measures

Below are the measures used in this study, each indicating the scoring procedures used.

The anxiety scale is an adaptation of Speilberger's State-Trait Anxiety Inventory (STAI). We found it necessary to adapt the measure to make it appropriate for junior high school students. In addition, we needed a measure that assessed anxiety in the context of school (as opposed to the home or with peers outside of school). The measure was carefully tailored to avoid confounding confidence with anxiety . The numbers on the scale were reversed where necessary and then summed to yield the anxiety score. Scores could range from a minimum of 20 to a maximum of 80. Most scores fell between 30 and 50.

In addition, the grades students received at the end of the first term of school (around the tenth or eleventh week) were obtained. The grade points for four academic classes were used as a dependent measure: English, Mathematics, Social Studies and Science/Health. The corresponding grades from the end of the sixth grade were obtained from the students' files, as were their scores on standardized achievement tests. These were used as controls for prior achievement in the achievement analysis.

THEORY OF INTELLIGENCE MEASURE

People have different ideas about their intelligence. Read each statement below and then circle the one mark that shows how much you agree with the statement.

You have a certain amount of intelligence and you really can't do much to change it.

1	2	3	4	5	6
strongly agree	agree	sort of agree	sort of disagree	disagree	strongly disagree

Your intelligence is something about you that you can't change very much.

1	2	3	4	5	6
strongly agree	agree	sort of agree	sort of disagree	disagree	strongly disagree

You can learn new things, but you can't really change your basic intelligence.

1	2	3	4	5	6
strongly agree	agree	sort of agree	sort of disagree	disagree	strongly disagree

SCORING IN BOLD FACE, LOW SCORES INDICATE AN ENTITY THEORY.

NOTE: For more information about the measures used in this study, please write for a copy of C. S. Dweck and V. L. Henderson, Theories of Intelligence: Background and Measures.

CONFIDENCE OF INTELLIGENCE

Below are three pairs of sentences. Read each pair and choose the one sentence that is most true for you. Then, using the scale below each pair, show how true the sentence you chose is for you.

1. Choose one of these:
   _____ I usually think I'm intelligent. **A**

   _____ I wonder if I'm intelligent. **B**

   How true is this sentence for you?

very true for me	true for me	sort of true for me

2. Choose one of these:
   _____ When I get new material, I'm usually sure I will be able to learn it. **A**

   _____ When I get new material, I often think I may not be able to learn it. **B**

   How true is this sentence for you?

very true for me	true for me	sort of true for me

3. Choose one of these:
   _____ I'm not very confident about my intellectual ability. **B**
   _____ I feel pretty confident about my intellectual ability. **A**

   How true is this sentence for you?

very true for me	true for me	sort of true for me

4. Choose one of these:
   _____ I'm not sure I'm smart enough to be successful. **B**
   _____ I'm pretty sure I'm smart enough to be successful. **A**

   How true is this sentence for you?

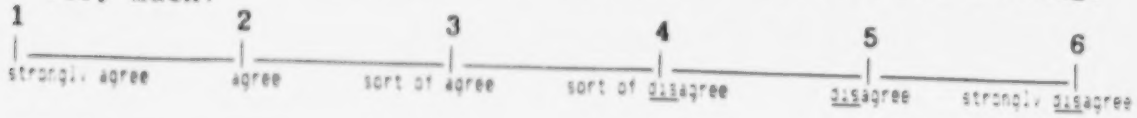
very true for me	true for me	sort of true for me

SCORING: IF THE "A" CHOICE IS SELECTED, "VERY TRUE" = 6, "TRUE" = 5, "SORT OF TRUE" = 4
IF THE "B" CHOICE IS SELECTED, "VERY TRUE" = 1, "TRUE" = 2, "SORT OF TRUE" = 3.
A LOW SCORE INDICATES LOW CONFIDENCE.

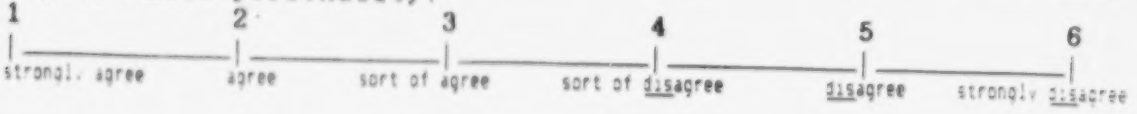
THEORY OF PERSONALITY MEASURE

People have different ideas about their personalities. Read each statement below and then circle the <u>one</u> mark that shows how much you agree with the statement.

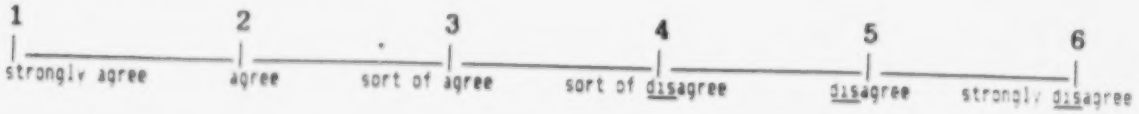
Your personality is something about you that you can't change very much.



You can do things to get people to like you but you can't change your basic personality.



You have a certain personality and there's not much you can do to really change it.



SCORING IN BOLD FACE, LOW SCORES INDICATE AN ENTITY THEORY.

CONFIDENCE OF PERSONALITY

Below are three pairs of sentences. Read each pair and choose the one sentence that is most true for you. Then, using the scale below each pair, show how true the sentence you chose is for you.

1. Choose one of these:
   _____ I usually think that other people like me. **A**

   _____ I wonder if people like me. **B**

   How true is this sentence for you?

   very true for me | true for me | sort of true for me

2. Choose one of these:
   _____ When I meet new people, I am not sure if they will like me. **B**

   _____ When I meet new people, I think that they will like me. **A**

   How true is this sentence for you?

   very true for me | true for me | sort of true for me

3. Choose one of these:
   _____ If I were another person choosing a friend, I am not sure I would choose me. **B**

   _____ If I were another person choosing a friend, I would choose me. **A**

   How true is this sentence for you?

   very true for me | true for me | sort of true for me

4. Choose one of these:
   _____ I am pretty sure that people like the kind of person I am. **A**
   _____ I am not sure that people like the kind of person I am. **B**

   How true is this sentence for you?

   very true for me | true for me | sort of true for me

SCORING: IF THE "A" CHOICE IS SELECTED, "VERY TRUE" = 6, "TRUE" = 5, "SORT OF TRUE" = 4
IF THE "B" CHOICE IS SELECTED, "VERY TRUE" = 1, "TRUE" = 2, "SORT OF TRUE" = 3.
A LOW SCORE INDICATES LOW CONFIDENCE.

ANXIETY MEASURE

Below are a number of statements that students have used to decribe themselves. Read each one and then circle the number to the right of the statement to indicate how you feel when you are at school. There are no right or wrong answers. Don't spend too much time on any one statement, just give the answer that seems to best describe how you feel at school.

1 = Almost Never
2 = Sometimes
3 = Often
4 = Almost Always

1. I feel calm.	1	2	3	4	R
2. I feel secure.	1	2	3	4	R
3. I am tense.	1	2	3	4	
4. I feel at ease.	1	2	3	4	R
5. I feel upset.	1	2	3	4	
6. I feel overwhelmed by all the demands.	1	2	3	4	
7. I worry about things that could go wrong.	1	2	3	4	
8. I feel satisfied.	1	2	3	4	R
9. I feel frightened.	1	2	3	4	
10. I feel comfortable.	1	2	3	4	R
11. I feel nervous and restless.	1	2	3	4	
12. I get jittery.	1	2	3	4	
13. I feel like I don't know what to do.	1	2	3	4	
14. I feel like I don't know what I want.	1	2	3	4	
15. I am relaxed.	1	2	3	4	R
16. I am worried.	1	2	3	4	
17. I feel like I've got it together.	1	2	3	4	R
18. I feel pretty mellow.	1	2	3	4	R
19. I get uptight about school.	1	2	3	4	
20. I feel confused.	1	2	3	4	

PREDICTING SCHOOL ANXIETY

INDEPENDENT VARIABLES:

Theory of Intelligence: Entity or Incremental
Confidence of Intelligence: High or Low
Theory of Personality: Entity or Incremental
Confidence of Personality: High or Low
Sex of Subject

ANALYSIS OF VARIANCE:

$F = 2.20$ $p < .0041$ $R^2 = .395$

Main Effects:

Theory of Intelligence $p < .008$
Confidence of Intelligence $p < .0046$
Confidence of Personality $p < .012$

Significant Interactions:

Theory of Intelligence X Confidence of Intelligence
Confidence of Intelligence X Confidence of Personality
Theory X Theory X Confidence of Personality

Note: Removing the effects of seventh-grade grades does not improve the model significantly, nor are grades a significant covariate. Grades account for less than 3% of the variance in anxiety.

As can be seen in Figures 1 and 2, the prediction was confirmed, entity theorists with low confidence do have higher anxiety. This is true in both the intelligence domain and in the social domain. Further, sex of the subject did not contribute significantly to the prediction of anxiety, nor did actual achievement, as measured by grades.

FIGURE 1: Mean Anxiety Scores by Theory of Intelligence and Confidence of Intelligence

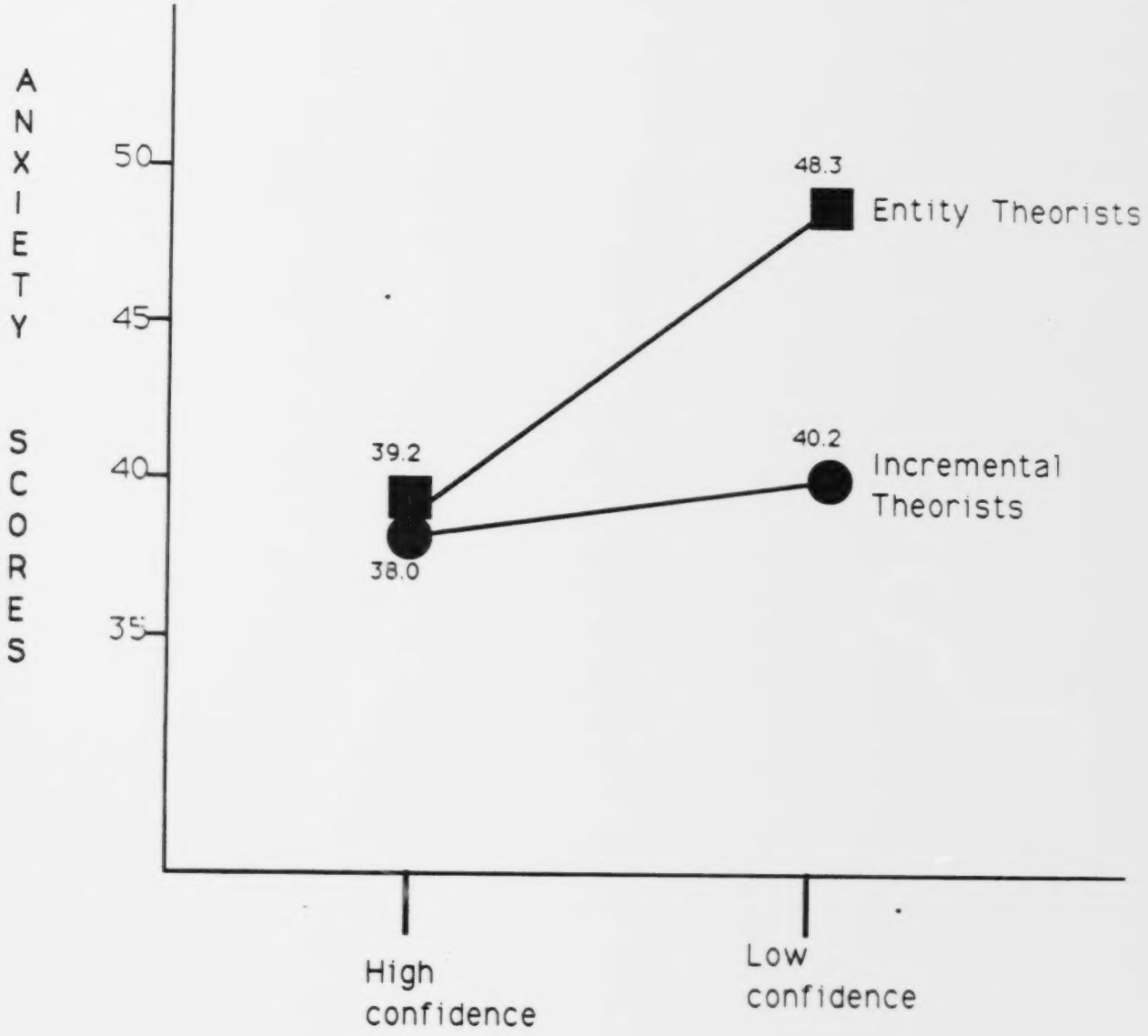


FIGURE 2: Mean Anxiety Scores by Theory of Personality and Confidence of Personality

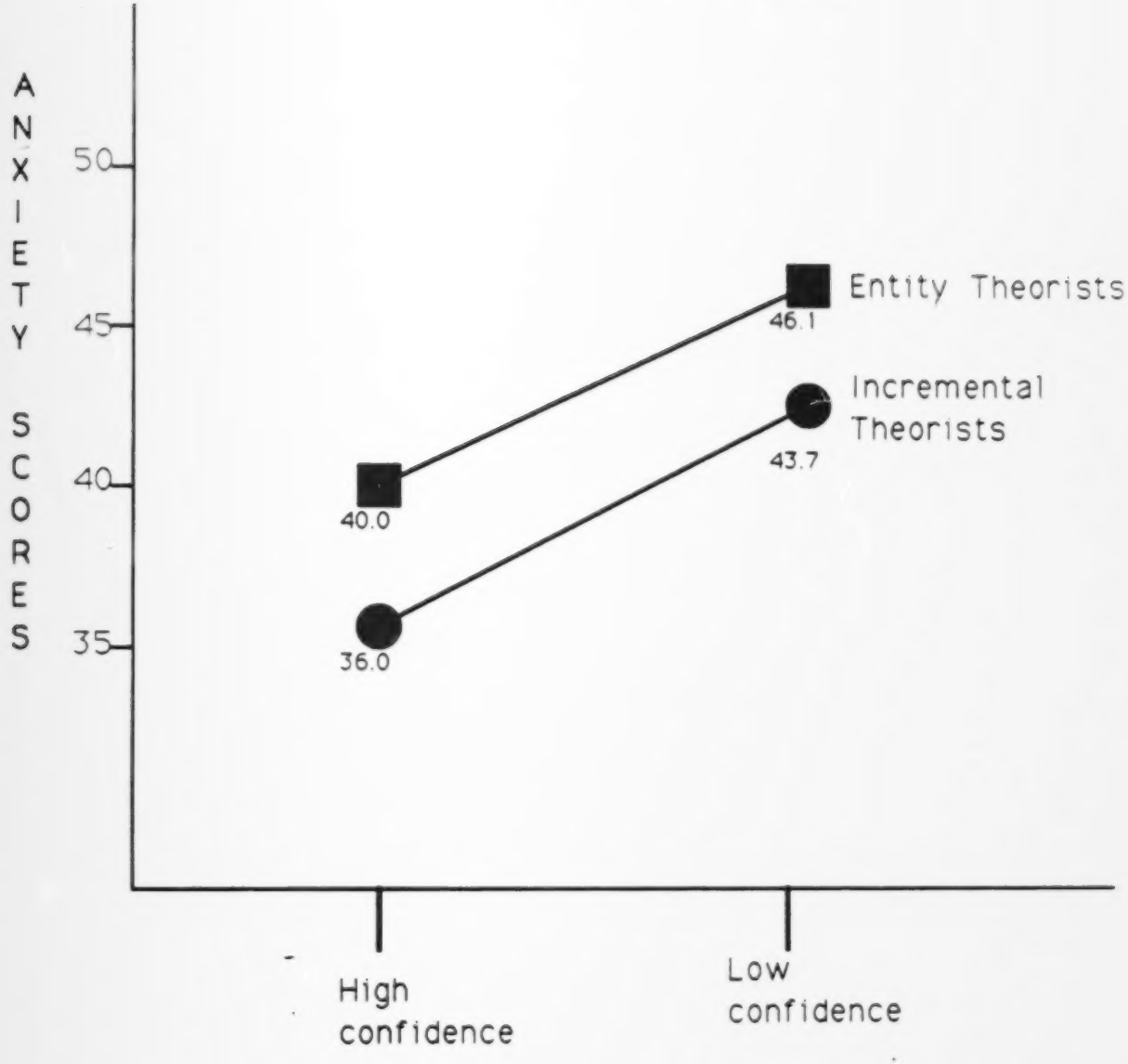


FIGURE 3: Mean Anxiety Scores by Confidence of Intelligence and Confidence of Personality

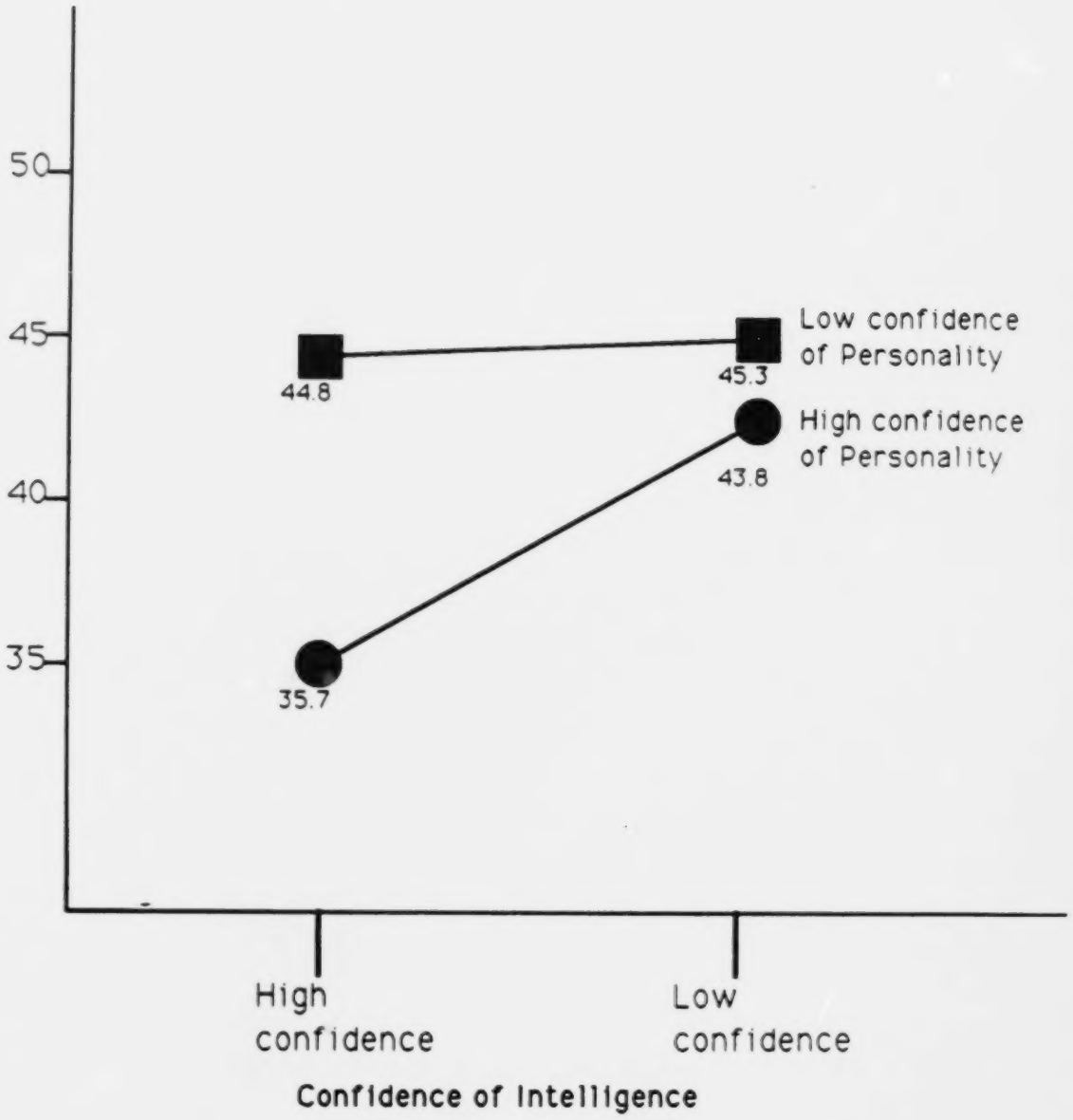
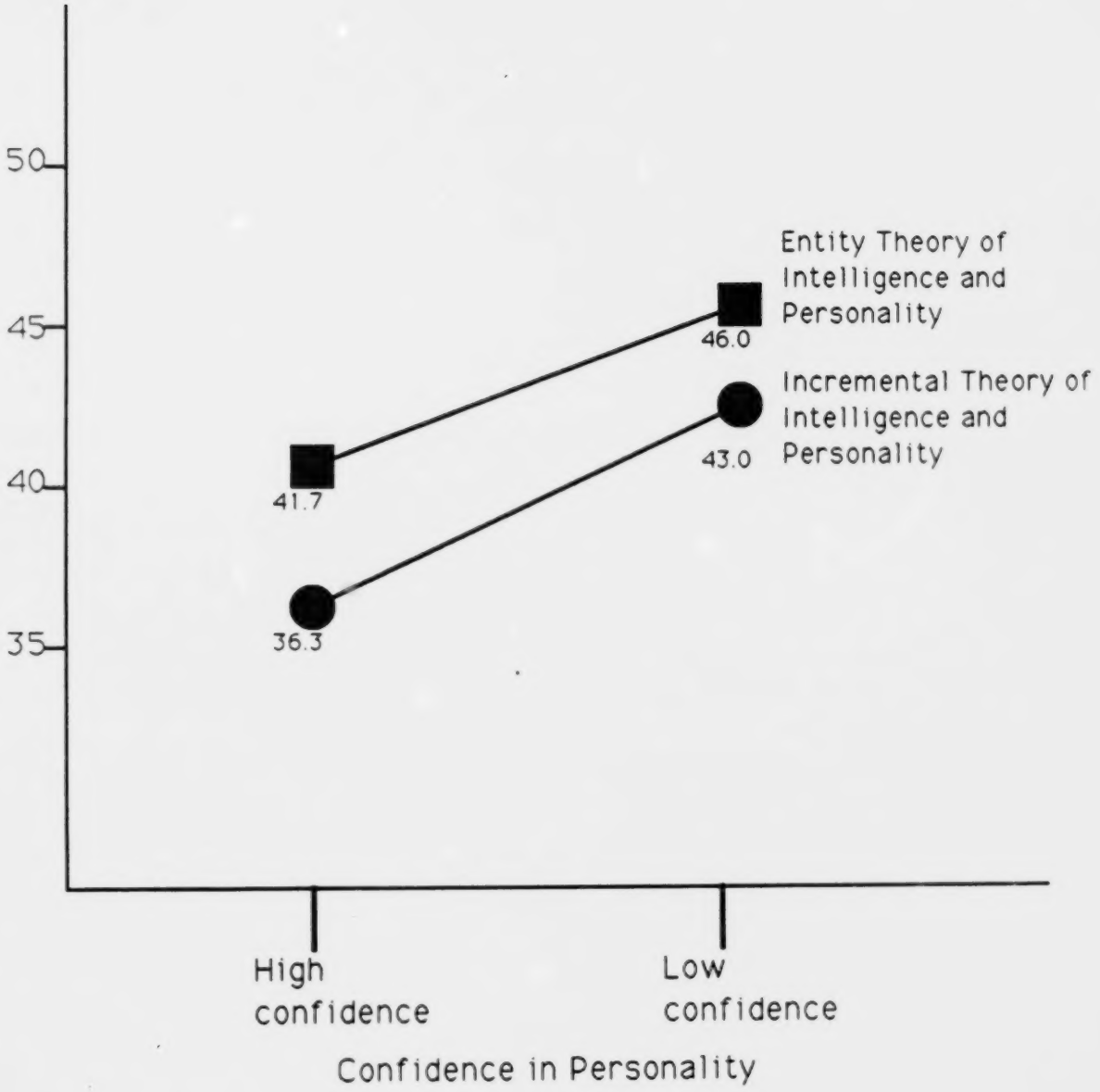


FIGURE 4: Mean Anxiety Scores by Concordant Theory and Confidence of Personality



PREDICTING SEVENTH-GRADE GRADES
ANALYSIS OF COVARIANCE

INDEPENDENT VARIABLES:
- Theory of Intelligence
- Confidence of Intelligence
- Sex of Subject

COVARIATE:
- Achievement Scores from Grade Six

Model:

$F = 12.82 \quad p < .0001 \quad R^2 = .44$

(Note: N = 139, 69 boys and 70 girls)

Covariate is highly significant, and accounts for 34% of variance

Main effects after prior achievement is removed:
- Theory of Intelligence $p < .013$
- Confidence of Intelligence $p < .008$

Significant Interactions:
- Theory X Confidence X Sex $p < .049$

Independent Variables alone (without the covariate) are significant predictors of achievement. $F = 3.98 \quad p < .0005 \quad R^2 = .15$

Replication of these findings using Sixth-Grade grades as the Covariate:

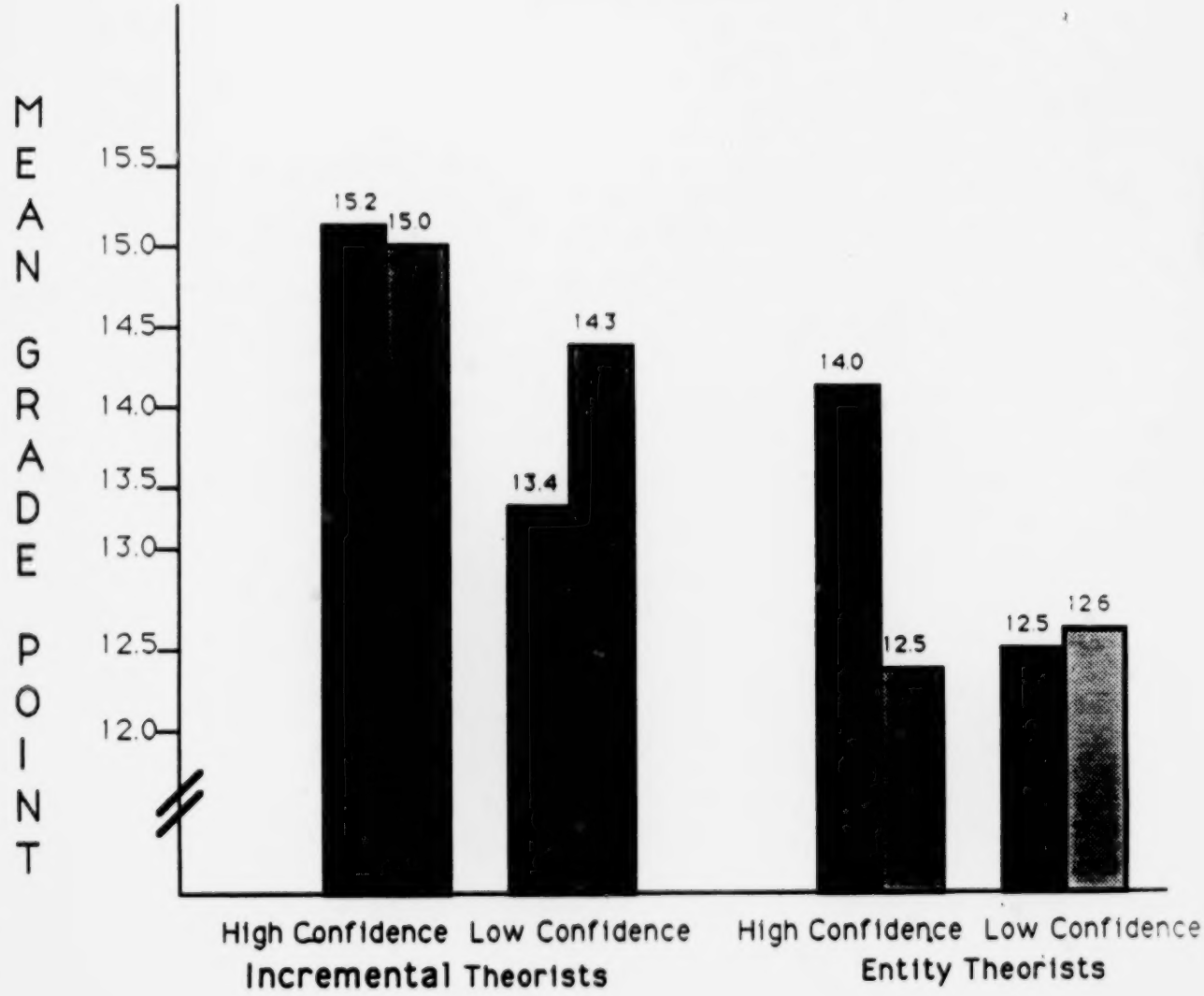
$F = 26.29 \quad p < .0001 \quad R^2 = .606$

Main effects after prior achievement is removed:
- Theory of Intelligence $p < .02$

Three-way interaction is also significant $p < .05$

As can be seen in Figure 5, theory of intelligence becomes an important predictor of academic achievement. Relative to what might be expected based on prior achievement, the incremental low confidence group is "over-achieving" while the entity high confidence is "under-achieving." Further, it can be seen that in general, the incremental theorists are doing better in school than are the entity theorists. A surprising result is that the main effect of confidence indicates that (relative to what might be expected based on prior achievement) students with low confidence are doing better than students with high confidence.

FIGURE 5: Mean Grade Point by Theory of Intelligence and Confidence of Intelligence



CONCLUSIONS

Question 1: **Yes**, within each domain, entity theorists with low confidence are reporting higher levels of anxiety. In the Intelligence domain, this is seen in the interaction between theory and confidence. In the personality domain this pattern is manifested in the two main effects of theory and confidence.

Question 2: **No**, gender was not significant in predicting anxiety, not as a main effect nor in any interactions. Actual school performance, as measured by grades, did not predict subsequent anxiety.

Question 3: **Yes**, there is a clear relationship between implicit theory of intelligence and academic performance, over and above the effects of prior achievement. Incremental theorists do better in school than do entity theorists. In fact, low-confident incremental theorists appear to be blossoming while high-confident entity theorists appear to be debilitated academically.

These results provide encouraging support for the theory proposed by Dweck and Leggett (1988). They also provide some insight into the longstanding controversy surrounding the "storm and stress" hypothesis, indicating that for some students, the changes in adolescence provoke a sense of threat and feelings of anxiety, whereas others may approach the same situations as opportunities for growth.